AMENDMENTS

Please amend the application as indicated hereafter.

In The Claims

38. An optical disk, comprising:

a recording layer having a servo track; and

a clock reference structure formed along the servo track, the clock reference structure permitting writing and re-writing of data having data fields of indeterminate length on the recording layer, the reference clock structure permitting generation of a clock reference signal used for writing and re-writing of the data, the clock reference structure having a spatial frequency that is within the spatial frequency spectrum of the data.

39. The optical disk as recited in claim 38, wherein the data can be written on the recording layer in a substantially continuous data stream to permit substantially uninterrupted reading of the data from the recording layer by using the clock reference signal.

40. The optical disk as recited in claim 38, wherein the recording layer is without permanent sectoring fields situated between the data fields and the sectoring fields having synchronization information and track address information.

41. The optical disk as recited in claim 38, wherein the clock reference structure itself includes synchronization and track address information.

42. The optical disk as recited in claim 38, wherein the clock reference structure comprises edges of grooves of the servo track that oscillate in-phase.

43. The optical disk as recited in claim 38, wherein the clock reference structure comprises edges of grooves of the servo track that oscillate out of phase.

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44. The optical disk as recited in claim 38, wherein the clock reference signal permits writing and re-writing of the data on the recording layer with sub-bit accuracy relative to the clock reference signal.

45. The optical disk as recited in claim 38, wherein the recording layer and clock reference structure are implemented so that a standard DVD Read-only reader can read the data but cannot detect the clock reference structure.

46. The optical disk as recited in claim 38, wherein an optical transducer is coupled to the clock reference structure and generates the clock reference signal.

47. The optical disk as recited in claim 46, wherein the optical transducer is coupled to data marks on the recording layer and generates a data signal having fundamental frequency components that define a data frequency spectrum corresponding to the spatial frequency spectrum of the data on the recording layer.

48. An optical disk, comprising:

recording means having a servo track for permitting writing and re-writing of data having data fields of indeterminate length; and

clock reference means associated with the servo track for permitting generation of a clock reference signal used for writing and re-writing data, the clock reference means having a spatial frequency that is within the spatial frequency spectrum of the data.

49. The optical disk as recited in claim 48, wherein the recording means permits data to be written on the recording layer in a substantially continuous data stream to permit substantially uninterrupted reading of the data from the recording means by using the clock reference signal.

50. The optical disk as recited in claim 48, wherein the recording means permits data to be written on the recording layer in either a continuous or discontinuous data stream by using the clock reference signal to permit uninterrupted reading of the data from the recording means.

51. The optical disk as recited in claim 48, wherein the recording means permits data to be written on the recording layer without permanent sectoring fields that are situated between the data fields and that have information pertaining to synchronization and track address information.

52. The optical disk as recited in claim 48, wherein the clock reference means encodes synchronization and track address information.

53. The optical disk as recited in claim 48, wherein the clock reference means comprises edges of grooves of the servo track that oscillate in-phase.

54. The optical disk as recited in claim 48, wherein the clock reference means comprises edges of grooves of the servo track that oscillate out of phase.

55. The optical disk as recited in claim 48, wherein the clock reference signal permits writing and re-writing of the data on the recording means with sub-bit accuracy relative to the clock reference signal.

56. The optical disk as recited in claim 48, wherein a standard DVD Read-only reader can read the data from the recording means but cannot detect the clock reference means.

57. An optical disk, comprising:

a recording layer having a servo track without permanent sectoring fields with information pertaining to synchronization information;

a clock reference structure formed along the servo track and comprising edges of grooves of the servo track which oscillate in-phase at an oscillation spatial frequency, the oscillation frequency corresponding to a clock reference spatial frequency, the clock reference structure permitting writing and re-writing of data marks having data fields of indeterminate length on the recording layer, the reference clock structure permitting generation of a clock reference signal used for writing and re-writing of the data, the clock reference structure having a spatial frequency that is within the spatial frequency spectrum of the data; and

wherein the recording layer permits writing and re-writing of data in a substantially continuous data stream to permit substantially uninterrupted reading of the data from the recording layer by using the clock reference signal.

58. The optical disk as recited in claim 57, wherein the recording layer permits writing and re-writing of data in either a continuous or discontinuous data stream to permit uninterrupted reading of the data from the recording layer.

59. The optical disk as recited in claim 57, wherein the clock reference structure itself includes synchronization and track address information.

60. The optical disk as recited in claim 57, wherein the clock reference signal permits writing and re-writing of the data on the recording layer with sub-bit accuracy relative to the clock reference signal.

61. The optical disk as recited in claim 57, wherein the recording layer and clock reference structure are implemented so that a standard DVD Read-only reader can read the data but cannot detect the clock reference structure.

62. The optical disk as recited in claim 57, wherein an optical transducer is coupled to the clock reference structure and generates the clock reference signal.

63. The optical disk as recited in claim 62, wherein the optical transducer is coupled to data marks on the recording layer and generates a data signal having fundamental frequency components that define a data frequency spectrum corresponding to the spatial frequency spectrum of the data on the recording layer.

64. An optical disk recorder, comprising:

an optical disk rotatably mounted on the recorder, the optical disk having a recording layer containing a servo track;

a first optical transducer optically coupled to the recording layer of the optical disk, the first optical transducer following a servo track as the optical disk rotates;

a clock reference structure formed along the servo track providing data fields of indeterminate length, the clock reference structure causing the first optical transducer to produce a clock reference signal as the optical disk rotates;

means for recording data on the recording layer of the optical disk, wherein the data is recorded to include fundamental spatial frequencies that define a spatial frequency spectrum;

a write clock being phase locked to the clock reference signal and used to determine the placement of data on the recording layer of the optical disk; and

wherein the clock reference structure has a spatial frequency that is within the spatial frequency spectrum of the data.

65. The optical disk recorder as recited in claim 64, wherein the data can be written on the recording layer by the recording means in a continuous data stream to permit uninterrupted reading of the data from the recording layer by using the clock reference signal.

66. The optical disk recorder as recited in claim 64, wherein the optical disk is without permanent sectoring fields situated between the data fields on the recording layer.

67. The optical disk recorder as recited in claim 64, wherein the clock reference structure itself includes synchronization and track address information and further comprising a means for decoding this information.

68. The optical disk recorder as recited in claim 64, wherein the servo track includes grooves and the clock reference structure comprises edges of the grooves which oscillate in-phase.

69. The optical disk recorder as recited in claim 64, wherein the data causes the first optical transducer to produce an unwanted data signal as the optical disk rotates, and the clock reference signal is separated from the unwanted data signal by detecting the clock reference signal using radial push-pull detection.

70. The optical disk recorder as recited in claim 64, wherein the servo track includes grooves and the clock reference structure comprises edges on the grooves which oscillate out-of-phase.

71. The optical disk recorder as recited in claim 64, wherein the data causes the first optical transducer to produce an unwanted data signal as the optical disk rotates, and the clock reference signal is separated from the unwanted data signal by detecting the clock reference signal using split detection.

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72. The optical disk recorder recited in claim 64, wherein the clock reference structure comprises pits formed along the servo tracks.

73. The optical disk recorder as recited in claim 64, wherein the data includes data marks that are positioned along the servo track according to a DVD Read-only standard.

74. The optical disk recorder as recited in claim 64, wherein the data includes data marks that are arbitrarily coded.

75. The optical disk recorder as recited in claim 64, further comprising a second optical transducer which is optically coupled to the data on the recording layer, the second optical transducer following the servo track as the optical disk rotates, the data causing the second optical transducer to produce a data signal as the optical disk rotates.

76. The optical disk recorder as recited in claim 76, wherein the first optical transducer comprises a first laser and a first objective lens and the second transducer comprises a second laser and a second objective lens.

77. The optical disk recorder as recited in claim 76, wherein a combination objective lens comprises both the first objective lens and the second objective lens, wherein a numerical aperture of the combination objective lens is adjustably controlled to be lower when reading data than when recording data.

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78. The optical disk recorder as recited in claim 76, wherein a wavelength of the second laser is greater than a wavelength of the first laser.

79. The optical disk recorder as recited in claim 64, wherein the recording means is capable of writing data on the recording layer with sub-bit accuracy.

80. The optical disk recorder as recited in claim 64, further including means for separating the data from the clock reference signal.

81. An optical disk recorder, comprising:

(a) means for receiving an optical disk having:

(1) recording means having a servo track for permitting writing of data having data fields of indeterminate length; and

(2) clock reference means associated with the servo track for permitting generation of a clock reference signal used for the storage of the data, the clock reference means having a spatial frequency that is within the spatial frequency spectrum of the data; and

(b) means for determining the clock reference signal based upon the clock reference means; and

(c) means for writing data upon the servo track based upon the clock reference signal so that the spatial frequency spectrum of the data overlaps the spatial frequency of the clock reference means.

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82. The optical disk recorder as recited in claim 81, wherein the means for writing data writes the data on the recording means in a continuous data stream to permit uninterrupted reading of the data from the recording means by using the clock reference signal.

83. The optical disk recorder as recited in claim 81, wherein the recording means is without permanent sectoring fields that are situated between the data fields and that have synchronization information and track address information.

84. The optical disk recorder as recited in claim 81, wherein the means for determining the clock reference signal can decode synchronization and track address information from the clock reference means.

85. The optical disk recorder as recited in claim 81, wherein the means for determining the clock reference signal can decode the clock reference means when defined as edges of grooves of the servo track that oscillate in phase.

86. The optical disk recorder as recited in claim 81, wherein the means for determining the clock reference signal can decode the clock reference means when defined as edges of grooves of the servo track that oscillate out of phase.

87. The optical disk recorder as recited in claim 81, wherein the means for writing data can write data on the recording means with sub-bit accuracy relative to the clock reference signal.

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88. A method, comprising the steps of:

providing an optical disk with a recording layer having a servo track, the servo track having a clock reference structure;

generating a clock reference signal from the clock reference structure; and

writing data having data fields of indeterminate length on the recording layer based upon the clock reference signal, the spatial frequency spectrum of the data overlapping the spatial frequency of the clock reference structure.

89. The method as recited in claim 88, wherein the data is written on the recording layer during the writing step in a continuous data stream to permit uninterrupted reading of the data from the recording layer by using the clock reference signal.

90. The method as recited in claim 88, further comprising the step of generating synchronization and track address information from the clock reference structure.

91. The method as recited in claim 88, wherein the clock reference structure comprises edges of grooves of the servo track that oscillate in-phase.

92. The method as recited in claim 88, wherein the clock reference structure comprises edges of grooves of the servo track that oscillate out of phase.

93. The method as recited in claim 88, wherein the step of writing data on the recording layer is performed with sub-bit accuracy relative to the clock reference signal.

94. The method as recited in claim 84, further comprising the steps of:

coupling an optical transducer to the clock reference structure to generate the clock reference signal; and

coupling the optical transducer to data marks on the recording layer and generating a data signal having fundamental frequency components that define a data frequency spectrum corresponding to the spatial frequency spectrum of the data on the recording layer.

95. An optical disk, comprising:

a recording layer having a servo track; and

a clock reference structure formed along the servo track, the clock reference structure permitting writing and re-writing of data having data fields of indeterminate length on the recording layer, the reference clock structure permitting generation of a clock reference signal used for the writing and re-writing of the data with sub-bit accuracy.

96. An optical disk, comprising:

recording means having a servo track for permitting writing and re-writing of data having data fields of indeterminate length; and

clock reference means associated with the servo track for permitting generation of a clock reference signal that can be used for writing and re-writing data with sub-bit accuracy.

97. An optical disk, comprising:

a recording layer having a servo track;

a clock reference structure formed along the servo track and comprising edges of grooves of the servo track which oscillate in-phase at an oscillation spatial frequency, the oscillation frequency corresponding to a clock reference spatial frequency, the clock reference structure permitting writing and re-writing of data marks on the recording layer in data fields of indeterminate length, the clock reference structure permitting generation of a clock reference signal that can be used for the writing and re-writing of the data with sub-bit accuracy.

98. An optical disk recorder, comprising:

(a) means for receiving an optical disk having:

(1) recording means having a servo track for permitting writing of data having data fields of indeterminate length; and

(2) clock reference means associated with the servo track for permitting generation of a clock reference signal used for the storage of the data; and

(b) means for determining the clock reference signal based upon the clock reference means; and

(c) means for writing data upon the servo track based upon the clock reference signal with sub-bit accuracy.